dissolved by ether, and stain black with osmic acid. They are doubtless desquamated endothelial cells.

Cultures from the right pleura and from the left pleura revealed staphylococcus pyogenes albus and aureus. Cultures from the peritoneal fluid revealed bacterium coli communis.

Within five hours of making the necropsy I inoculated three rabbits subcutaneously (in the William Pepper Laboratory of Clinical Medicine) with an emulsion of the softened retroperitoneal glands. One rabbit died the following day from peritonitis due to puncture of the intestine with the inoculating needle. The other two rabbits lived in excellent health, and were finally killed on April 6, 1905. No lesions were found at the necropsy.

REPORT OF A CASE OF METASTATIC ENDOTHELIOMA.

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The patient was a white man, aged forty-three years. His occupation was that of a salesman. There was nothing in his family history of any note except that his father died of carcinoma of the œsophagus, and a brother died of a complication of cardiac and renal affections. There was nothing in his previous medical or surgical history of any importance until the year 1900. During that year he noticed a small nodular mass on the surface of the right testicle. The testicle became painful and began to increase in size. It was firm in consistence and showed no sign of breaking down in any part of it. This condition gradually increased until the final removal of the testicle. In the opinion of the surgeon the growth was sarcomatous.

After a lapse of over two years, in 1902, the patient felt the presence in the remaining testicle of the same symptoms that formerly had attracted his attention—namely, the nodule of the size of a buckshot, the increase in consistence, the swelling, and the pain. Again he was advised to have the radical operation performed, which he consented to. In this instance the histological examination was made by a competent pathologist, who pronounced it a large round-cell sarcoma.

Following this second operation the patient's health improved, though he was never robust. In September, 1904, following a fall, he began to complain of backache. Seldom was he free from pain, which usually was of the dull, boring character, though at times it was of the stabbing variety. The patient thought that this more severe pain was relieved coincidentally with the voiding of his urine.

This pain persisted with intervals of comparative freedom followed by exacerbations which would necessitate his remaining in bed several days at a time. In many respects this pain simulated lumbago. During this time the patient kept his full weight and showed no signs of cachexia.

In January, 1905, he came under my care with the simple history of pain in the lumbar region. This pain was most obstinate and resisted the largest doses of morphine. About the middle of January I detected in the left upper quadrant of the abdomen, just within and below the splenic area, a globular-shaped mass which was absolutely immovable in any position the patient might assume. This mass was uncovered by gut and was perfectly flat on percussion. The spleen was normal in size and position. The left kidney could not be palpated in its normal position, while the right was palpable. All other viscera were normal to physical examination.

The provisional diagnosis of malignant disease of the left kidney was made and it was advised that an exploratory incision be made with a view to a possible nephrectomy. The exploratory incision was made and revealed directly beneath the peritoneum a kidney enlarged to about three times the normal size, being irregular in contour and consistence, which was placed almost transversely across the abdomen, corresponding to a line drawn from the gall-bladder to the spleen. The organ was bound down to the lumbar spine by very dense adhesions, and could not be moved a fraction of an inch. It transmitted the pulsations of the abdominal aorta. The surgeons found a nephrectomy to be impracticable and the wound was closed with nothing done. He rallied feebly from the shock of even this slight operation.

A few days later it was noticed that the right leg was considerably œdematous and there was a marked difference in the temperature between it and the left leg, which was much warmer. It gave the patient considerable discomfort, though not acutely painful. The œdema soon extended to the scrotum.

For a few days the patient was free from the lumbar pain, but it soon returned with added violence and could not be relieved by morphine.

Ten days after the operation the patient was seized with pain in the side, over the base of the right lung and became cyanosed. For a short time his condition was grave, but he rallied. Just previous to this he had begun a "prune-juice" expectoration, which now became very fetid and was expelled by a painful cut-off pleuritic cough. The temperature, which hitherto had been normal, now rose to 104°, and delirium developed. It was apparent that the condition was gangrene of the lung. Twenty-four hours later the patient died with a large pulmonary hemorrhage.

An autopsy was immediately done. The tumor mass was found to be the left kidney. It was bound to the spine by such dense adhesions that it could only be torn out piecemeal. There was nothing that resembled normal kidney tissue and, in fact, it was structureless save in small areas, the bulk being made up of a mass of soft caseous material. At one point it was broken down. The right kidney was normal excepting a slight increase in size which was probably compensatory hypertrophy.

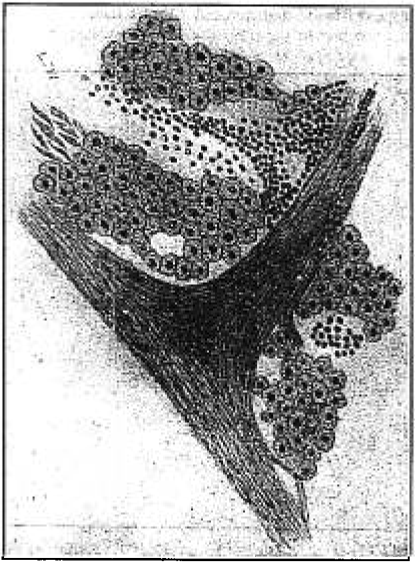


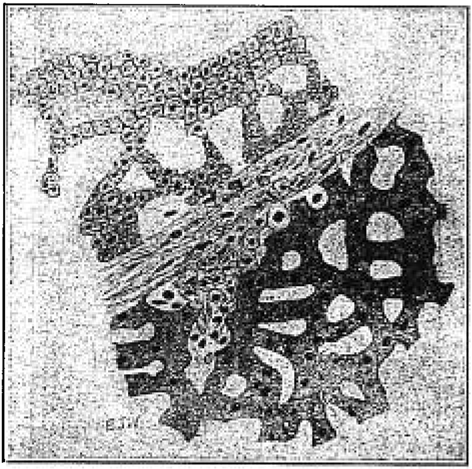
FIG. 1

Macroscopic examination of the liver showed no changes except that on the anterior surface there was a small round nodule, white in color, depressed in the centre, and sharply defined.

Between the right lung and the costal pleura there was found some delicate adhesions, which were easily broken up. The base was consolidated and showed a small area of gangrene. No other gross changes were found in any of the remaining organs.

The left kidney was so diseased that it was with some difficulty a suitable specimen could be obtained for the microscopic examination. The sections were stained with hæmatoxylon and eosin. Only small portions of the tissue here and there would take the stain, the bulk of the section being made up of large homogeneous areas apparently of the type of hyaline degeneration. Occasionally this degenerated material had the appearance of coarse connective tissue, sometimes of the fibrous variety, and again it had a peculiar appearance resembling degenerated muscle fibre. Fig. 1 represents a section taken from the most organized part of the left or diseased kidney. The large T-shaped mass of connective tissue is composed of what appears to be degenerated fibrous tissue, which is homogeneous in appearance. Interspersed throughout the fibres are found accumulations of small round cells which take a deep stain with hæmatoxylon. The cells have the appearance of round-cell sarcoma. In smaller numbers is another cell not so well organized which is but little affected by the stain. The greater portion of the section is made up of large cells, usually polygonal in shape, with large nuclei which take a deep stain with hæmatoxylon. The cells are packed closely together and often it is difficult to make out the outline of the individual cell. The protoplasm of the cells is homogeneous and stains but faintly. Between these cells is seen an extensive mass of the same small round cells described above as

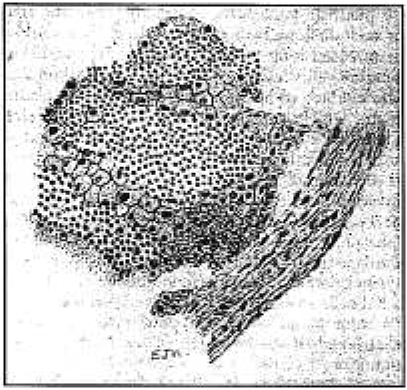
FIG. 2



occurring in the connective tissue. In addition to this large mass of cells there are several smaller pockets. The large cells are evidently of the endothelial variety. These large cells with occasional small round cells were found here and there in small clusters throughout the hyaline mass of tissue.

Sections of the liver through the small nodule above mentioned were also stained in eosin and hæmatoxylon. The liver cells are found in the majority of instances to be practically normal except near the surface of the organ, where there are few evidences of a fatty degeneration, but this is extremely limited and only found where the endothelial growth is beginning to encroach on the liver tissue. Fig. 2 shows the section of liver in which the capsule is thickened and beyond the capsule, but in intimate contact with it is a mass of endothelial cells. This mass of cells makes up the nodule which was described above. These endothelial cells are placed around large irregularly shaped spaces, making a sort of mesh work with no particular pattern. In the sketch the capsule of the liver shows invasion of these endothelial cells. In the liver tissue is a cleft which is filled with connective tissue and with the same endothelial cells. The shapes of the cells vary and apparently the cells adapt their shapes to these open spaces. The cell outline is indistinct. The protoplasm of the cell stains faintly and is homogeneous. The nuclei of the cells are large, well defined, and take a deep stain. The cells closely resemble in many ways the cells found in the kidney; the chief differences are in shape and size.

FIG. 3



There is a marked absence of the small round cells which are so abundant in the kidney. There is, however, a cell somewhat larger but otherwise much resembling it which had invaded the liver tissue.

Evidently from the general condition of the organ the growth had made but little headway in the liver. Had the little nodule not have attracted attention there would have been nothing in the general appearance of the organ to suggest a metastasis. The liver was otherwise normal to gross appearances.

The lung tissue showed hemorrhagic infraction. It becomes a question to account for this condition of infarction. Either it was due to an infectious embolus or else to the invasion of the tumor cells. In the light of an absence of any active or healed tuberculous lesion and no previous history of any pleuritic trouble it was natural to suspect a pleuritic metastasis, especially when the frequency of this site for endothelioma was considered. Fig. 3 shows a section through the diseased lung with the pleura. Just within the pleura is noted the same cell which predominated Figs. 1 and 2. This cell is in intimate contact with and within the bloodvessels, and this is the only tissue which demonstrates this relation to the vascular system. There is an extravasation of blood throughout the tissue, being a part of a general condition. What role the tumor cells played in the fatal occlusion of a bloodvessel is a question. Certainly the lung was invaded by the tumor before the fatal accident occurred. It is likewise certain that there was in the body of the patient a source for the production of an infectious embolus. The lung was probably the last organ invaded, and yet in many respects it gave the most typical demonstration of endothelioma. In many places the endothelial cells so arranged themselves that it gave the appearance of a tubular gland. None of these cells were discovered in the pleura, although it showed signs of marked changes but more of an inflammatory nature.

The tumor of the testicle was unquestionably a large round-cell sarcoma, and it is altogether likely that this was the original source of the disease. If this be the case and the metastatic tumors being of the endothelial variety, it is another evidence that endothelioma is a pure sarcomatous tumor.

It is a notable fact that the metastasis was exceedingly slow for a sarcomatous tumor. From the time of invasion to death there elapsed a period of nearly five years.

I am indebted to Dr. C. H. Bunting, of the Johns Hopkins Hospital, for valuable assistance in the microscopic work.